

ABSTRACT

The present invention relates to a semiconductor laser element and the like which can efficiently emit laser beams at a small emission angle using a simpler configuration. The semiconductor laser element has a structure where an n-type cladding layer, active layer and p-type cladding layer are sequentially laminated. The p-type cladding layer has a ridge portion for forming a refractive index type waveguide in the active layer. The ridge portion, at least the portion excluding the edges, extends in a direction crossing each normal line of both end faces of the refractive index type waveguide, which corresponds to the light emitting face and light reflecting face respectively, at an angle θ , which is equal to or less than the complementary angle θ_c of the total reflection critical angle on the side face of the refractive index type waveguide. The optical paths of light components which resonate in the refractive index type waveguide formed by the ridge portion having the above form are limited to optical paths where the lights are totally reflected on the side face of the refractive index type waveguide. In other words, the laser beams emitted from the light emitting end have a spatial horizontal single mode, and the waveguide width can be increased to further decrease the emission angle of the laser beams.